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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,711	02/05/2002	Joachim Szczymbowski	LYB3-210.1-Cont	8488

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EXAMINER

VERSTEEG, STEVEN H

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 04/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/067,711

Applicant(s)

SZCZYRBOWSKI ET AL.

Examiner

Steven H VerSteeg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-26 is/are pending in the application.
- 4a) Of the above claim(s) 24-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 08/959,633.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

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DETAILED ACTION

Election/Restrictions

- I. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 22 and 23, drawn to a method for sputter-induced deposition of metal oxide layers, classified in class 204, subclass 192.12.
 - II. Claims 24-26, drawn to an optically acting layer system, classified in class 359, subclass 581.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the process as claimed can be used to make a materially different product such as an insulating layer on a semiconductor device.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with James Crawford on April 10, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 22 and 23.

Affirmation of this election must be made by applicant in replying to this Office action. Claims 24-26 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Priority

6. This application filed under former 37 CFR 1.60 lacks the necessary reference to the prior application. A statement reading "This is a continuation of Application No. 08/959,633, filed October 28, 1997, now issued as U.S. Patent 6,451,178 B2." should be entered following the title of the invention or as the first sentence of the specification. Also, the current status of all nonprovisional parent applications referenced should be included.

Drawings

7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: **12** (see Figure 3b), **22** (see Figure 5b), **32 & 34** (See Figure 7b), **W_p**, **P1**, and **P2** (see Figure 9), **P3 & P4** (see Figure 10), and **B** (see Figure 11). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

8. The disclosure is objected to because of the following informalities: Applicant should delete reference to claims 1, 2, 5, and 8 in the instant application at page 2, line 17; page 3, lines

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2 and 12; and page 4, line 13. The claims are not currently pending in the instant application.

Also, if the application is allowed, the claim numbers might not correspond to the final-renumbered claims.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 22 and 23 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 22 and 23 require the target to be "sprayed", but there is no support in the specification as originally filed for the target to be "sprayed".

Therefore, the matter is considered to be new and must be canceled.

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 22 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

13. Claim 22 recites the limitation "the plasma discharge" in line 2. There is insufficient antecedent basis for this limitation in the claim.

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14. Claim 22 recites the limitation "the sputter target to be sprayed" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

15. Claim 22 recites the limitation "the plasma reaction space" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

16. Claim 23 recites the limitation "the target material to be sprayed" in line 4. There is insufficient antecedent basis for this limitation in the claim.

17. Claim 23 recites the limitation "the electrodes" in line 4. There is insufficient antecedent basis for this limitation in the claim.

18. Claim 23 recites the limitation "the electrical supply" in line 6. There is insufficient antecedent basis for this limitation in the claim.

19. Claim 23 recites the limitation "the plasma discharge" in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,169,509 to Latz et al. (Latz) in view of US 5,415,757 to Szczrbowski et al. (Szczrbowski) and *Thin Film Processes* by Vossen et al. (Vossen).

22. For claim 22, Applicant requires a method for sputter-induced deposition of metal oxide layers by reactive sputtering wherein an electrical output is supplied to the plasma discharge by

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means of at least two electrodes arranged adjacent to one another where the output is selected such that the metal oxide layers are deposited at a growth rate of ≥ 4 nm/s, the substrate is stationary, and AC power is supplied to the electrodes at a frequency of 10-80 kHz.

23. Latz discloses a sputtering process (col. 3, l. 11-21) comprising providing two electrodes 5, 5a each connected to AC power (abstract). During the deposition process, metal targets are reactively sputtered in an atmosphere of oxygen to produce a metal oxide (col. 2, l. 29-35). The frequency of the AC power is 1-100 KHz (col. 3, l. 11-14). The substrate does not move (Figure 1).

24. Latz does not disclose the deposition rate or specify the frequency to be specifically between 10-80 kHz.

25. Vossen discloses that deposition rate is directly proportional to the power applied to the targets such that increasing the power supplied will increase the deposition rate (pg. 61-62). Therefore, the deposition rate is a result effective variable.

26. It would have been obvious to one of ordinary skill in the art at the time the invention was made to deposit the metal oxide at a rate of ≥ 4 nm/s because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

27. Szcyrkowski discloses that when AC sputtering, the ideal frequency is 40 kHz because it results in the best quality film produced because the arcing buildup is reduced (col. 5, l. 30-68).

28. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Latz to utilize a frequency of 40 kHz because of the desire to produce the metal oxide film with the best properties.

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29. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Reactive alternating current magnetron sputtering of dielectric layers* by Scherer et al. (Scherer) in view of *Thin Film Processes* by Vossen et al. (Vossen).

30. For claim 23, Applicant requires a method for sputter-induced deposition of metal oxide layers by reactive sputtering wherein an electrical output is supplied to the plasma discharge where the output is selected such that the metal oxide layers are deposited at a growth rate of ≥ 40 nm m/s, the substrate is moved along in front of the targets, and AC power is supplied to the electrodes at a frequency of 10-80 kHz.

31. Scherer discloses a process for depositing a metal oxide layer by reactive AC magnetron sputtering (abstract). The process involves using an apparatus with two electrodes (Figure 1a) and applying the AC power at a frequency of 40 kHz (pg. 1772). The substrates are moving (Figure 1a).

32. Scherer does not disclose the deposition rate for the metal oxides to be ≥ 40 nm m/s, but does disclose that the deposition rate achieved for 7kW power applied when forming aluminum oxide to be 3.3 nm (Table 1).

33. Vossen discloses that deposition rate is directly proportional to the power applied to the targets such that increasing the power supplied will increase the deposition rate (pg. 61-62). Therefore, the deposition rate is a result effective variable.

34. It would have been obvious to one of ordinary skill in the art at the time the invention was made to deposit the metal oxide at a rate of ≥ 40 nm m/s because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

General Information

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (703) 308-0661.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Palestine Jenkins at (703) 308-3521.


For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (703) 308-0661.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H VerSteeg whose telephone number is (703) 305-4473. The examiner can normally be reached on Mon - Thurs (7:30 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Steven H VerSteeg
Primary Examiner
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